UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 9
75 Hawthorne Street
San Francisco, CA 94105-3901

April 8, 2002

Dr. Jeff Marqusee
ESTCP Director and SERDP Technical Coordinator
ESTCP Program Office
901 North Stuart Street, Suite 303
Arlington, VA 22203

RE: Support for Perchlorate Analytical Method Development

Dear Dr. Marqusee,

The Pacific Southwest Region of the Environmental Protection Agency (EPA Region 9) would like to request the support of the ESTCP Program for the Navy's development of a promising analytical method for perchlorate (ClO_4-). The enclosed September 23, 1997, memorandum from our Regional Administrator to the primary EPA Assistant Administrators provides some background for this chemical and emphasizes the need for improved analytical methods. Since 1997, information on toxicity has trended to the microgram per liter (part per billion) level in drinking water and information on occurrence of perchlorate as a water contaminant has grown nationwide.

The current analytical method for perchlorate in drinking water is EPA method 314.0 which was first developed by the State of California in 1997. This method has distinct limitations including interference from other dissolved chemicals. Many samples of soils, plant tissue, contaminated groundwater and even surface water from our arid region are not suitable for the drinking water analytical method.

In our effort to determine perchlorate levels in agricultural areas around California's Salton Sea, we have learned that the Indian Head Division Naval Surface Warfare Center is developing a method for the detection of trace amounts of perchlorate in complex environmental matrices. Currently, a proof-of-concept study is being performed to establish detection limits in water, soil and vegetable matter. Encouraging preliminary results provided the basis for a proposal to ESTCP for a multiple laboratory independent evaluation and validation of this method.

I would like to offer our support and endorsement for the Navy's proposal for Multi-Laboratory Validation for the Trace Analysis of Perchlorate in Environmental Matrices. The multi-laboratory validation is an essential step toward increasing the ability of federal, state, tribal and local agencies to accurately characterize the concentration of perchlorate in water, soil, and other media. Since perchlorate is predominantly associated with national defense and the space program, continued technical support from the Department of Defense serves to increase public

confidence in their commitment to environmental stewardship.

I would like to thank you in advance for support in this matter. In addition to my role as the Regional Perchlorate Coordinator, I serve on the executive committee of the Interagency Perchlorate Steering Committee and as the Co-chair of the Occurrence Subcommittee. We need the analytical methods advanced to be able to address the challenges posed by this contamination. If you would like to discuss this further please feel free to call me at (415) 972-3176.

Sincerely,

Kevin P. Mayer

Kevin P. Mayer
Region 9 Perchlorate Coordinator, SFD-7-2

Enclosure: Memo from Felicia Marcus, EPA Region 9 Administrator, September 23, 1997

FILE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

SEP 23 1997

OFFICE OF THE
REGIONAL ADMINISTRATOR

MEMORANDUM

SUBJECT: Request for Technical and Policy Assistance for Perchlorate Contamination of Water in Region 9

FROM: Felicia Marcus

TO: Bob Perciasepe, OW
Tim Fields, OSWER
Henry Longest, ORD

We are writing to bring to your attention the recently-discovered perchlorate contamination of water. Perchlorate is a man-made salt and a primary component of ammonium perchlorate rocket fuel. In March, 1997, a method was developed by the State of California to detect perchlorate well below the previous detection limit. As a result of this new method, perchlorate was "discovered" contaminating groundwater at several Superfund and RCRA sites in California at facilities that test and manufacture rockets. Groundwater wells for twenty-two public water supply agencies have been contaminated in California, along with other private and agricultural wells. (Table attached) Perchlorate was further discovered at low levels in the Colorado River by the Metropolitan Water District of Southern California, which uses the river to supply a large percentage of the population of Southern California. This contamination has been traced to an area near Las Vegas where two large perchlorate manufacturing facilities have been located. Las Vegas is completely dependent on water from the Colorado River. Phoenix and Tucson are also increasing their use of Colorado River water. More than 12 million people in Nevada, Arizona and California may be exposed to perchlorate in their drinking water in the 4 to 18 ppb range. California is the only state we are aware of with a standard which is an Interim Action Level of 18 ppb.

We very much need assistance from headquarters to address perchlorate contamination as a threat to drinking water resources in Region 9. A detailed request for assistance follows, but in summary, we recommend that the Agency take action to identify potential areas of perchlorate contamination nationwide; to develop national analytical protocols; to increase the toxicological information on perchlorate and expedite its evaluation; and to address technological and regulatory solutions to perchlorate in public drinking water supplies. We appreciate Bob Perciasepe's immediate efforts to make perchlorate a candidate for the setting of a federal standard. We are aware of increasing Congressional interest in treatment technologies and health effects of perchlorate in water.(See attached Newspaper article.) While we have formally notified the states in our Region of the serious nature of perchlorate contamination, the Agency should consider implementing a communication strategy for states outside Region 9, as well as developing a forum for public involvement in national policy issues concerning perchlorate.

1.) Identification of Potential Sources: Although the environmental and public health problem has only recently been identified in California, Nevada, Arizona and the tribes along the Colorado River, perchlorate has been produced and used nationwide. Most of the perchlorate made in the U.S. was produced for the Department of Defense and NASA. The seven known sites in California where perchlorate has been released into groundwater resulted from facilities that test and manufacture rockets. Since only a few laboratories, almost all in California, have the capacity to detect low concentrations in the range of EPA's provisional reference dose, we believe that the awareness of perchlorate problems in other states will grow rapidly. Perchlorate is quite persistent in the environment, and is very soluble and mobile in both groundwater and surface water.

In Region 9, we have tested water from Superfund sites in California and other states that may be affected by perchlorate and have advised public health officials in each state of the perchlorate issue. The State of California has instituted state-wide testing of wells potentially threatened by perchlorate releases. We are providing technical support and expertise to the State of Nevada to attempt to prevent further contamination of the Colorado River.

We recommend that the Agency send a letter to both DOD and NASA asking them to identify all of the facilities, both private and federally owned, that manufactured and used perchlorate. Additionally, we recommend that DOD and NASA be advised to sample and analyze soil and water that may have been affected by releases of perchlorate at these facilities.

2.) Health Effects and Toxicology: The health effects of perchlorate are known from human and animal testing when perchlorate was used as a medication for hyperthyroidism. At sufficiently high doses, perchlorate disrupts functioning of the thyroid gland. The health effects of long-term exposures to low concentrations have not been studied directly. The developmental effects of perchlorate on infants are similarly untested. In 1995, EPA established a provisional reference dose for perchlorate in a range of 4 to 18 ppb based on studies of acute toxicity to humans. The State of California used this information as the basis for an 18 ppb Interim Action Level for perchlorate in drinking water.

The 1995 review identified a number of areas where additional toxicological information was needed. The only current study that we are aware of is being conducted for the Air Force and Aerojet. At our request, EPA experts in Cincinnati are actively overseeing Air Force plans to conduct a toxicological study of perchlorate effects on mammals. We have contacted the National Institute of Environmental Health Sciences to nominate perchlorate for the National Toxicological Program (NTP) and we request your support for prioritization of this request.

We recommend that the Agency increase its oversight of the Air Force/Aerojet study as well as consider sponsoring its own studies. There have been particular concerns raised about the effect of perchlorate on infants and developing fetuses, since perchlorate acts to inhibit the functioning of the thyroid. There are no adequate studies of the chronic effects of perchlorate on either adults or infants. The Agency should rapidly assess any toxicological information as it

becomes available and provide drinking water advisories and regulatory advice as appropriate.

3.) **Treatment Technologies:** There are currently no known, economical methods that treat low levels of perchlorate in water. We are reviewing treatment technologies such as reverse osmosis and anaerobic biological digestion at the Superfund sites affected by perchlorate. We are also actively communicating with vendors of treatment technologies to encourage development of promising methods for treating perchlorate. We are working with ORD experts at the NERL in Las Vegas to increase our understanding of perchlorate chemistry and behavior. (See attached report).

Because both source identification and health effects studies will take months to develop, it is imperative that the Agency develop cost-effective treatment technologies as soon as possible. We recommend that EPA's technical expertise be mobilized to provide primary research on the chemistry of perchlorate in water and to oversee the development of potential treatment technologies.

4.) **Analytical Protocol Development:** Region 9 has requested that the ORD laboratory in Las Vegas formally review the analytical protocols developed by California. Our own Region 9 laboratory has begun to develop the capability to detect low levels of perchlorate. We recommend that a national effort be made to develop and publish EPA analytical protocols. EPA laboratories around the country should be encouraged to establish their capabilities for low-detection-limit analysis of perchlorate to allow rapid assessment of potential areas of contamination.

5.) **Public Involvement:** Such widespread occurrence of perchlorate in public water supplies has received a high level of interest by the media and citizens groups. We have received adamant requests in both California and Nevada for public participation in the oversight of toxicological testing and in the development of public policy on perchlorate in water supplies. (See attached letters.) Media interest has been quite high and there has been lively debate in public forums at local water agencies. We have responded to many requests for information from the news media, public officials, environmental organizations and individual citizens. We recommend that a mechanism for meaningful public involvement be incorporated in establishment of EPA's national policy on perchlorate.

Thank you for your assistance. If you have questions regarding perchlorate, please call Kevin Mayer at (415) 744-2248. If you have questions regarding drinking water, please call Bill Thurston, (415) 744-1851.

cc: Fred Hansen

Enclosures